



# UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER FOR PATENTS  
P.O. Box 1450  
Alexandria, Virginia 22313-1450  
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/738,394	12/17/2003	Seung Woo Jin	CU-3494 RJS	7987
26530	7590	10/06/2004	EXAMINER	
LADAS & PARRY LLP 224 SOUTH MICHIGAN AVENUE SUITE 1200 CHICAGO, IL 60604			DANG, TRUNG Q	
			ART UNIT	PAPER NUMBER
			2823	

DATE MAILED: 10/06/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

<b>Office Action Summary</b>	<b>Application No.</b>	<b>Applicant(s)</b>	
	10/738,394	JIN ET AL.	
	<b>Examiner</b>	<b>Art Unit</b>	
	Trung Dang	2823	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

#### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

#### Status

- 1) ☐ Responsive to communication(s) filed on \_\_\_\_.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

#### Disposition of Claims

- 4) ☒ Claim(s) 1-10 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-10 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_ are subject to restriction and/or election requirement.

#### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

#### Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All    b) ☐ Some \* c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

#### Attachment(s)

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)  | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. ____. |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)   | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date <u>5/21/04</u> . | 6) <input type="checkbox"/> Other: ____.  |

## DETAILED ACTION

### *Claim Rejections - 35 USC § 102*

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

2. Claims 1, 3-6, and 8-10 are rejected under 35 U.S.C. 102(b) as being anticipated by Tseng (U.S. Pat. 5,599,736).

With reference to Figs. 1-4 and 6-7, the prior art anticipates the claimed invention in that it discloses method for fabricating a semiconductor device, which comprises the steps of:

forming a gate line 4 on a semiconductor substrate;

forming junction regions 6 in the semiconductor substrate at both sides of the gate line;

forming and selectively removing an interlayer insulating film 8 on the resulting substrate to form contact holes 9 exposing the junction regions;

forming plugs in the contact holes; and

implanting impurity ions into the plugs; and

annealing the junction regions (Figs. 6-7 and col. 4, lines 42-53).

Note that, as for claim 3, the impurity implantation into the plugs (col.

4, lines 46-50) is performed after the annealing step disclosed in col. 4, lines 16-17.

For claim 4, the annealing step disclosed at col. 4, lines 49-50 is performed after the step of implanting impurity into the remaining polysi **10** in the contact opening.

For claim 6, see col. 4, lines 8-10 when the step of Fig. 3 is considered as to meet the claimed limitation "forming plugs".

For claim 8, the wet etching (col. 4, lines 30-34) that results in the structure of Fig. 6 inherently forms a thin oxide on the surface of polysi plug **10** because polysi is oxidized in phosphoric acid solution to some extent.

For claim 10, see col. 4, lines 46-50.

### ***Claim Rejections - 35 USC § 103***

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claims 2 and 7 are rejected under 35 U.S.C. 103(a) as being unpatentable over Tseng as above in view of Akamatsu et al. (U.S. Pat. 6,312,981).

Tseng teaches a method for fabricating a semiconductor device as described above. Tseng differs from the claims in that while Tseng employs furnace annealing, the claims call for a rapid thermal annealing (RPT). However,

Akamatsu teaches a RTA treatment for activating source/drain regions so as to eliminate point defects in the source/drain (col. 14, lines 23-30). Thus, the subject matter as a whole would have been obvious to one of ordinary skill in the art to modify Tseng's process by performing the annealing steps using RTA as suggested by Akamatsu because the RTA not only eliminates point defects but also prevents source/drain impurity from being diffused into channel region, thereby affecting the desired performance of the device.

For claim 7, see col. 10, lines 26-35 for the teaching of the ramp-up rate during the RTA. As for the claimed ramp-down rate, it would have been obvious that after the annealing process is complete, the temperature must be reduced to lower temperature for subsequent process such as metallization or to room temperature when the device is complete. And the determination of a particular rate as claimed would have been obvious to one skilled in the art because it has long been held that, absent a showing of criticality by applicant, where the general conditions of a claim are disclosed in the prior art, it is not inventive to discover the optimum or workable range by routine experimentation. In re Aller, 220 F.2d 454, 456, 105 USPQ 233, 235 (CCPA 1955). In re Kulling, 897 F.2d 1147, 14 USPQ2d 1056 (Fed. Cir. 1990); and In re Geisler, 116 F.3d 1465, 43 USPQ2d 1362 (Fed. Cir. 1997).

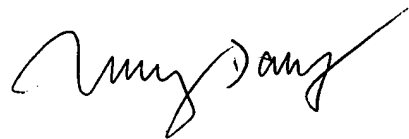
For the claimed gas atmosphere, the examiner takes official notice that RTA under gas atmosphere such as claimed is conventional in the art.

5. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Trung Dang whose telephone number is 571-272-1857. The examiner can normally be reached on Mon-Friday 9:30am-6:00pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Olik Chaudhuri can be reached on 571-272-1855. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Trung Dang  
Primary Examiner  
Art Unit 2823



10/01/04

Application/Control Number: 10/738,394  
Art Unit: 2823

Page 6